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Portland General Electric Company
121 SW Salmon Street • Portland, Oregon 97204

March 2, 2009
ES-050-2009
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Mr. Christopher Cora, RPM
Office of Environmental Cleanup, EPA Region 10
1200 Sixth Avenue (ECL-115)
Seattle, WA 98101

Re: Harbor Oil Site
USEPA Docket No. CERCLA-10-2007-0106
Fish Population Survey

Dear Mr. Cora:

Attached please find the Harbor Oil Voluntary Group's proposal to survey the fish population in Force Lake. This survey will provide additional information on the types and population densities of fish that are present in the lake. This Memorandum provides the methodology for the proposed survey.

Please call me if you have any questions at 503-464-8524.

Sincerely,

Jayne Allen

Windward environmental LLC

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MEMORANDUM

To:	Harbor Oil Superfund Site Voluntary Group
From:	Windward
Subject:	Proposed fish population survey sampling design for Force Lake
Date:	February 26, 2009

In response to the January 6, 2009 U.S. Environmental Protection Agency (EPA) recommendations for Phase 2 sampling at the Harbor Oil Superfund Site, the Voluntary Group proposed to conduct a fish population survey in Force Lake to obtain additional information on the types of fish that are present in the lake and to estimate their abundance and sizes. This memorandum presents methodology for surveying the fish population in Force Lake.

FORCE LAKE FISH POPULATION SURVEY

Objective

The fish population in Force Lake will be surveyed to evaluate which, if any, fish species are present in the lake and to estimate their abundance and sizes.

Design

The Voluntary Group is proposing to survey the fish population in Force Lake in response to EPA's recommendation. The study is designed to determine the presence/abundance/sizes of fish likely to be targeted by fishermen for consumption. It is to be noted that Force Lake was stocked with approximately 300 juvenile channel catfish during the summer of 2005 or 2006 by the Oregon Bass and Panfish Club.[1] Other

[1] Force Lake fish stocking information was provided by Bill Egan (program director, Oregon Bass and Panfish Club) and Todd Alsbury (district biologist for ODFW) during phone conversations on December 19, 2008. The juvenile channel catfish used to stock Force Lake were from a hatchery in California, and thus are not resident fish.

fish, including brown bullhead, sunfish, and carp[2] may also be present in Force Lake, and could serve as the target species, depending on the relative size and abundances.

Methods

The fish population in Force Lake will be surveyed using several methods to ensure that a complete picture of the fish population in the lake is obtained. Fish collection methods differ in their effectiveness at catching different fish species and sizes. The selection of the most appropriate methods is dependent on the types of fish that are being targeted and on the aquatic habitat being evaluated.

After the fish population survey has been completed, the Voluntary Group will consult with EPA regarding the results of the survey and to evaluate the need for fish tissue sampling.

Lake Description

Force Lake is a small lake (approximately 12 acres) with a maximum depth of approximately 3 feet. The lake is bordered on the south and west sides by the golf course, on the southeast side by Force Avenue, and on the north side by the wetlands that separate the lake from the Harbor Oil facility. During Phase 1 sampling, it was observed that the lake bottom sediment is generally quite soft, and is composed of silt and fine sand. Additionally, vegetation (e.g., grass hummocks) covers the lake bottom in some areas.

Selection of Sampling Methods

The methods for this fish population survey were selected to target larger fish (greater than 20 cm in length) because the survey is being done to support the human health risk assessment.[3] The *Standard Fish Sampling Guidelines for Washington State Ponds and Lakes* (WDFW 2000) was used as the basis for the development of the Force Lake sampling plan.

The fish survey at Force Lake will utilize the following methods:

- **Electrofishing**: A boat-mounted electrofisher will be used from a small boat to conduct electrofishing in Force Lake. All of the fish species that are potential target species (i.e., channel catfish, carp, brown bullhead, pumpkinseed, and bluegill) in Force Lake are known to have swim bladders, and thus, can be targeted by electrofishing. The electrofisher settings will be tailored to the conditions (e.g., temperature) measured by the field crew at Force Lake, but will generally be done using a pulsed direct current (WDFW 2000).

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[2] These fish species were collected during 1988 and 1989 Fishman study (1989).

[3] The need to collect fish tissue data to support the baseline ecological risk assessment (BERA) was evaluated in the Preliminary Site Characterization Report. As discussed in specific comment 1 of the response to comments document submitted to EPA by the Voluntary Group on February 2, 2009, fish tissue data is not needed to support the BERA.

- **Fyke or hoop nets:** Fyke nets are known to be effective at catching fish such as crappie in shallow waters (WDFW 2000; Sutton 2005). Nets will be set in Force Lake perpendicular to the shore; lead and wing nets will be staked out to funnel fish into the traps. Fyke nets with larger *mesh (mesh* size around 0.5 inches) will be used because they are generally more successful at capturing larger fish (the larger mesh size is less visible to fish).
- **Fish traps**: Baited fish traps (e.g., standard collapsible minnow traps) will be deployed in Force Lake. Bait will consist of commercially available frozen smelt and frozen shad, which will be cut into small pieces and placed into each trap's bait bag.

Fish traps and fyke or hoop nets will be set out in Force Lake in the afternoon, before electrofishing begins. These passive sampling devices will be left in Force Lake over night before being retrieved. Electrofishing will be conducted during the evening when fish are generally more active. Studies have shown increased electrofishing success during these times (WDFW 2000; Schoenebeck et al. 2005). Because of the small size of Force Lake, one evening of sampling should be sufficient to characterize the fish population.

Electrofishing will be done from a boat along parallel transects to ensure good spatial coverage of Force Lake during the sampling. Two boats will be used to conduct the fish survey. The first boat will be responsible for electrofishing and for the collection of the fish. The fish will be held in a large container of water, and will be passed to the second boat for processing. All fish that are collected during the survey effort will be recorded by species, and the length and weight of fish will be noted on field sampling forms. After this information is recorded for each fish, the fish will be released back into the lake in an area that has already been surveyed to minimize the likelihood of recapture.

Beach seining was not included as a primary sampling method for Force Lake both because of habitat limitations (limited shore access and vegetation on the lake bottom), and because beach seining is typically used when targeting juvenile and other small fish.

Seasonal Timing of Sampling

To help ensure that the fishing survey is defensible, the survey should occur during the spring once the water in Force Lake has warmed. Because of the shallow depth and small size of Force Lake, the water temperature is directly influenced by the seasonal air temperature. Warmer water temperatures will aid the sampling effort in two ways:

- As water temperatures increase, water conductivity also increases, which makes electrofishing more efficient.
- Fish are generally most active at their preferred temperatures (generally in the mid 50s to low 70s for most species). At temperatures above or below these levels, fish are less active and thus are harder to catch (especially when using fish traps).

Permit Considerations

A permit will be required from ODFW before the fish survey can be conducted. Permits are generally approved 4 to 6 weeks after being submitted. Target species and sampling methods will be outlined in the permit.

REFERENCES

Fishman. 1989. Force Lake fisheries evaluation. Pepared for Western Columbia Wetlands Conservancy. Fishman Environmental Services, Portland, OR.

Schoenebeck CW, Strakosh TR, Guy CS. 2005. Effect of block net use and time of sampling on backpack electrofishing catches in three Kansas reservoirs. North Am J Fish Manage 25:604-608.

Sutton R. 2005. Reclamation: managing water in the West. Examples of large river fish sampling methods. PowerPoint presentation. Bureau of Reclamation, US Department of the Interior, Washington, DC.

WDFW. 2000. Standard fish sampling guidelines for Washington state ponds and lakes. June, 2000. Washington Department of Fish and Wildlife: Science Division, Olympia, WA.